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Navy-NASA SSM/I Validation Experiment KRMS Data Products

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ABSTRACT

The Navy K_a-band Radiometric Mapping System (KRMS) was used to acquire high-resolution passive microwave imagery of sea ice in the Bering, Chukchi, and Beaufort Seas during the joint Navy-NASA SSM/I validation experiment in March 1988. Additionally, imagery of rivers and lakes was acquired in the vicinity of Fairbanks, Alaska, on two different days during this period. Information presented here constitutes an index to digital tapes of KRMS imagery acquired during these flights.

ACKNOWLEDGMENTS

Data indexed here were acquired with funds provided both by the Oceanographer of the Navy (OP-096, project element 63704N) through the Satellite Applications Technology (SAT) Program, A.E. Pressman, Program Manager, and by NASA through the Polar Programs Office, R. Thomas, Project Manager. We thank Bruce Heydlauff of the Naval Weapons Center, China Lake, California, who provided assistance in analog to digital conversion of KRMS data.

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INTRODUCTION

In March 1988 single-band (33.6-GHz, vertical polarization) passive microwave imagery was acquired with the Navy K_a-band Radiometric Mapping System (KRMS) in support of the Navy–NASA SSM/I Sea Ice Validation Experiment. The experiment was conducted to verify and validate estimates of total sea ice concentration and multiyear sea ice concentration retrieved from data acquired by the Special Sensor Microwave/Imager (SSM/I), a satellite-borne, multiband, passive microwave imaging system flown as part of the Defense Meteorological Satellite Program (DMSP) sensor suite. KRMS imagery was acquired to provide a ground truth data set for sea ice validation programs sponsored by the Navy (Eppler and Hawkins, 1985) and NASA (Cavalieri and Swift, 1987).

KRMS is particularly well suited to this application. Radiometric characteristics of open water, first-year ice and multiyear ice are unique at the KRMS frequency. Each of the three surfaces can be discriminated unambiguously in KRMS images (Eppler et al., 1986). This, coupled with the good spatial resolution and wide swath of the KRMS, makes the sensor ideal for mapping sea ice type and deriving sea ice concentration.

Ice conditions in four arctic regions were imaged with KRMS over a 6-day period as part of the experiment (Table 1) (Farmer et al., 1989a). Aerial mosaics were flown in the Cape Lisburne region of Alaska (Fig. 1), the Bering Sea between St. Lawrence and St. Matthew islands (Fig. 2), and the Chukchi Sea (Fig. 3). A continuous strip of imagery was acquired along a 2000-km transect extending from Harrison Bay, Alaska, to coastal waters near Ellesmere Island (Fig. 4). Subsequently the Chukchi, Cape Lisburne, and Beaufort data sets were analyzed to derive total sea ice concentration and the concentration of the multiyear fraction of the pack (Cavalieri et al., 1990).

DIGITAL TAPE PRODUCTS

Image data were digitized from analog tapes on an AT-compatible computer running under DOS according to procedures described by Eppler and Heydlauff (1991). A significant portion of this processing was accomplished in a Fairbanks motel room within hours of the completion of the data flights. These data were used to plan subsequent flights. The remaining data were processed at the Naval Oceanographic and Atmospheric Research Laboratory (NOARL) Polar Oceanography Branch Office in Hanover, New Hampshire, after the field experiment was completed.

Table 1. KRMS flights in support of the Navy-NASA SSM/I Validation Experiment.

Region imaged with KRMS	Date	Flight pattern	Coincident data sets
Cape Lisburne	8 March 1989	mosaic	GEOSAT
Beaufort Sea	11 March 1989	transect	JPL-SAR, Goddard AMMR, ERIM-SAR LANDSAT
Bering Sea	13 March 1989	mosaic	JPL-SAR, Goddard-AMMR LANDSAT
Chukchi Sea	14 March 1989	mosaic	JPL-SAR, Goddard-AMMR AVHRR

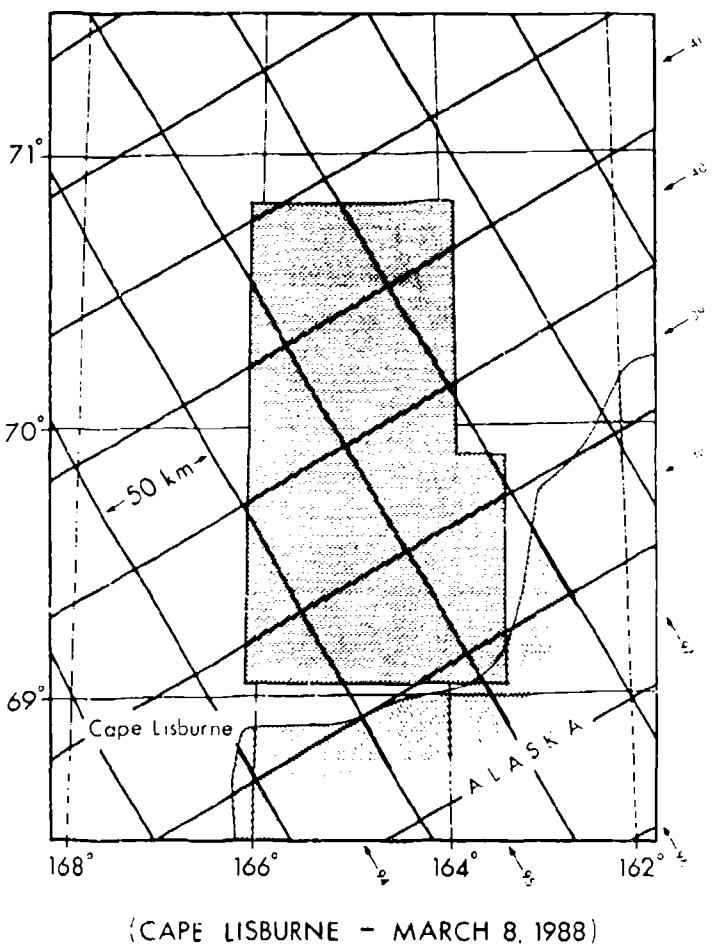
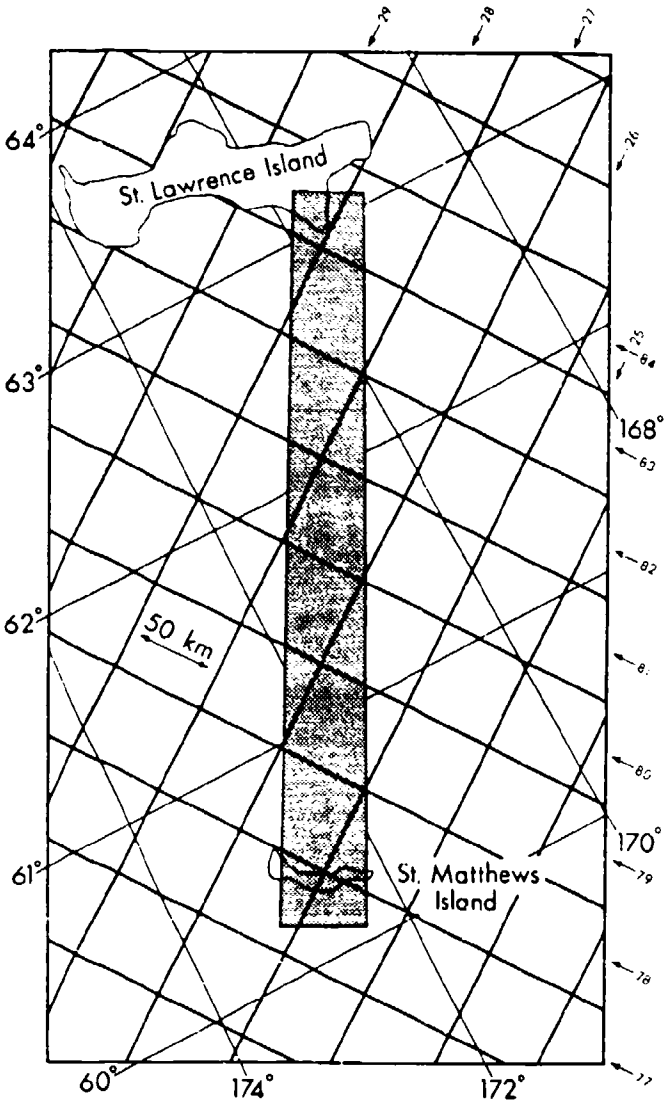
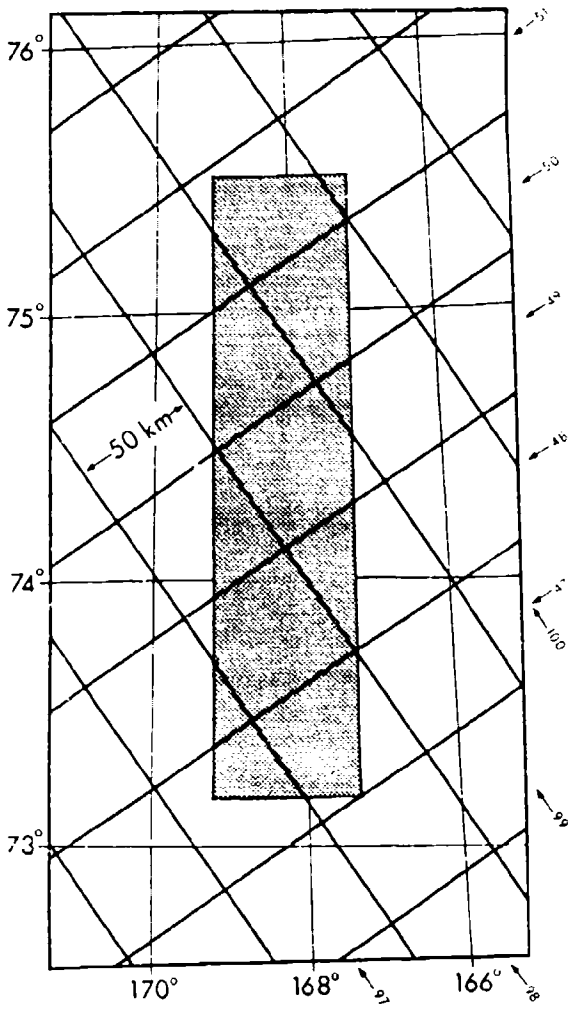


Figure 1. Location map of the KRMS Cape Lisburne mosaic. The shaded box encloses the area imaged in the mosaic. These boundaries are approximate; in most instances the area imaged extends slightly beyond the area shown. Cell boundaries of the NASA SSM/I 50-km grid (heavy lines) are superimposed on the latitude-longitude grid (light lines) Small numbers along the right hand margin and bottom margin refer to row and column coordinates of the NASA grid.



(BERING SEA - MARCH 13, 1988)

Figure 2. Location map of the KRMS Bering Sea mosaic. Refer to Figure 1 for explanation.



(CHUKCHI SEA - MARCH 14, 1988)

Figure 3. Location map of the KRMS Chukchi Sea mosaic. Refer to Figure 1 for explanation

Raw digital files were copied into a XENIX-based system for subsequent processing and for production of two different sets of archive tapes. The two sets of tapes, both of which are indexed here (App. A and B), contain the same radiometric information but differ in terms of the format in which the information is recorded and in terms of ancillary data recorded in conjunction with KRMS radiances. One set of data was produced using the XENIX "tar" function and contains both pixel intensities and a code that signifies the KRMS antenna used to acquire the data. The other set of tapes was produced using the XENIX "dd" function and contains only pixel intensities. In subsequent sections we use these function names (tar and dd) to distinguish one set of archive tapes from the other. We provide indices to tar tapes and dd tapes in Appendices A and B. The primary difference between tar tapes and dd tapes is the format in which the data are recorded.

tar format

tar is a XENIX/UNIX tape function that copies entire directories to backup media. Data archived with tar are compressed and the file directory structure typical of UNIX and XENIX systems is preserved. Users running under XENIX (and probably UNIX) should be able to restore KRMS image

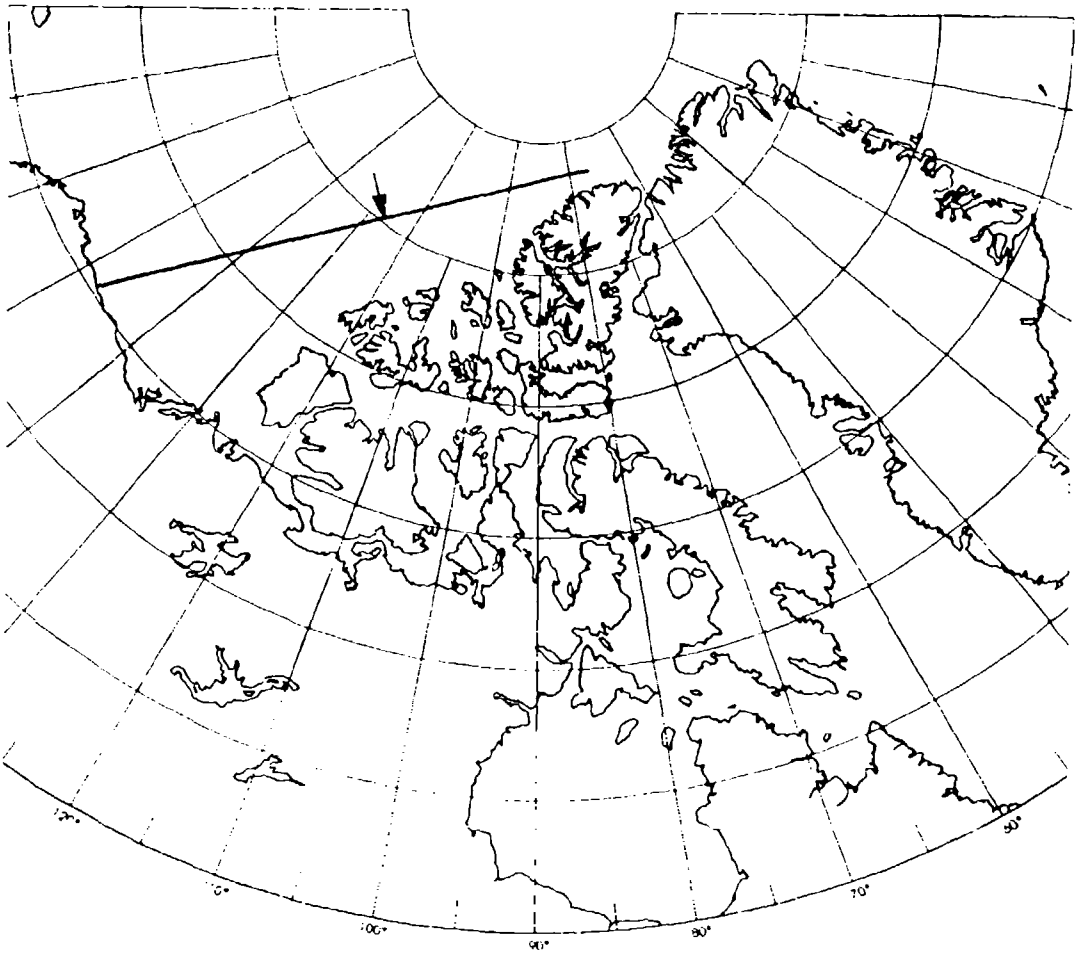


Figure 4. Location map of the KRMS Beaufort Sea–Ellesmere Island transect. Note that continuous imagery was acquired on both the outbound and inbound legs along this track.

files directly from these tar tapes. However, data stored in this way typically are illegible to non-UNIX/XENIX systems; users running under other operating systems probably will find their experience with the tar tapes somewhat less than rewarding.

dd format

dd is the general purpose file-copying utility provided by XENIX. Data in dd files are preserved in a standard format that is compatible with counterpart I/O utilities resident in most operating systems. KRMS data tapes written with dd reside in binary format in unlabeled files with constant record length and block size. Data written with dd are neither compressed, nor stored in a directory structure. KRMS users on non-XENIX systems (Xontech, Arete), such as the U.S. Army Cold Regions Research and Engineering Laboratory Geological Sciences Branch and the NOARL Remote Sensing Branch, have not encountered significant problems reading KRMS dd files, although some systems require byte swapping.

Images recorded on both sets of tapes are stored by scan in the sequence the scans were acquired by KRMS. One scan consists of radiances measured across the entire 100° field of view by one of three KRMS antennas. Later scans in a file represent data acquired farther downtrack than

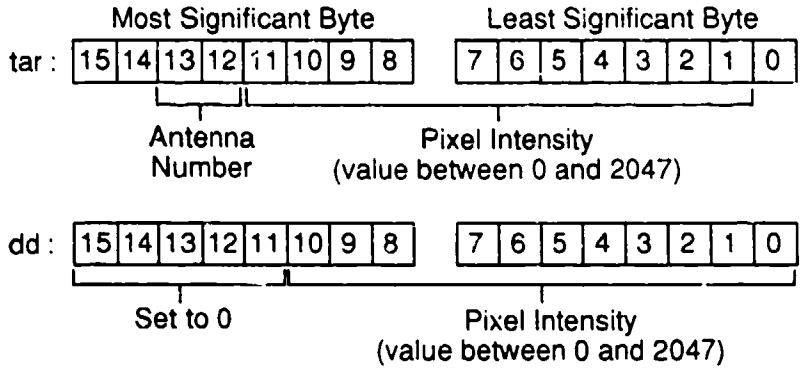


Figure 5. Bit patterns used for pixels recorded on tar and dd archive tapes. On tar tapes, pixel intensity is stored in bits 1–11, and a numeric code that identifies the KRMS antenna used to obtain the data is stored in bits 12 and 13. The antenna code will be an integer, 0, 1, or 2. Bit 0 is forced high (set to 1) by the interface to the digitizing hardware. Bits 14 and 15 float, but generally are 0 and 1, respectively. On dd tapes, the 11-bit pixel intensity has been shifted to the least significant bits (0–10) Bits 11-15 are set to 0.

those from scans that occur at the beginning of a file. Each image consists of 2,048 scans, each scan consists of 512 pixels, and each pixel occupies two 8-bit bytes. The first 1024 bytes in a file, for example, contain unsigned integer values for the 512 pixels that constitute the first scan in the image. Images that are adjacent to one another have been recorded with an overlap of approximately 50 scans. That is to say that approximately the first 50 lines of one image duplicate data in the last 50 lines of the previous image.

Figure 5 shows differences in bit patterns used for pixels on tar and dd tapes. Pixels on tar tapes include a two-bit antenna code that has been stripped from pixels on dd tapes. This code signifies which of the three KRMS antennas was used to acquire data stored in the pixel. The antenna code is not part of the pixel value and must be masked when images are restored from tar tapes. Integral values recorded on both sets of tapes represent relative intensities sensed by KRMS; these data are not calibrated and, in this form, do not correspond directly to radiometric brightness temperatures. See Farmer et al. (1989b) for discussion of methods by which these data can be converted to 33.6-GHz brightness temperatures.

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APPENDIX A: INDEX TO tar FORMAT TAPES

Notes on column headings:

Gains and offsets: Those listed here were applied to the analog signal during the digitization process and are independent of gains and offsets given in logs by Farmer et al. (1989) All files digitized with the same gain and offset probably can be calibrated with the same equation. Changes in gain and offset may require that the calibration equation be adjusted.

Number of lines lost: This refers to the minimum number of scans that are missing from each image as a result of asynchronous timing between digitizing rates characteristic of the A/D converter and the rate at which the AT computer can copy data.

Tape numbers: Analog tape number is the number of the analog mission tape on which data were recorded aboard the P-3A aircraft. Digital tape number refers to the number of the archived tar tape.

TRANSIT.1

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	66	21:52:30	21:57:32	1.900	5.740	2048		A	1	
F2	66	21:59:27	22:04:28	1.900	5.740	2048		A	1	
F3	66	21:04:23	22:09:37	1.900	5.740	2048		A	1	
F4	66	21:09:30	22:15:02	1.900	5.740	2048		A	1	
F5	66	22:14:55	22:20:27	1.900	5.740	2048		A	1	
F6	66	22:20:20	22:25:53	1.900	5.740	2048		A	1	
F7	66	22:25:46	22:31:19	1.900	5.740	2048		A	1	
F8	66	22:31:12	22:36:44	1.900	5.740	2048		A	1	
F9	66	22:36:37	22:42:08	1.900	5.740	2048		A	1	
F10	66	22:42:01	22:47:33	1.900	5.740	2048		A	1	
F11	66	22:47:26	22:52:59	1.900	5.740	2048		A	1	
F12	66	22:50:00	22:55:32	1.900	5.740	2048		A	1	
F13	66	22:55:25	23:00:11	1.900	5.740	2048		A	1	

CRREL 1

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	69	01:05:18	01:06:53	1.90	5.72	2048	8	B	2	
F2	69	01:06:47	01:08:24	1.90	5.72	2048	8	B	2	
F3	69	01:08:19	01:09:55	1.90	5.72	2048	7	B	2	
F4	69	01:11:25	01:11:25	1.90	5.72	2048	9	B	2	FAIRBANKS
F5	69	01:11:19	01:12:55	1.90	5.72	2048	8	B	2	FAIRBANKS
F6	69	01:12:49	01:14:25	1.90	5.72	2048	7	B	2	
F7	69	10:14:19	01:15:55	1.90	5.72	2048	12	B	2	
F8	69	01:15:49	01:17:25	1.90	5.72	2048	8	B	2	
F9	69	01:17:19	01:18:55	1.90	5.72	2048	8	B	2	
F10	69	01:18:49	01:20:25	1.90	5.72	2048	7	B	2	
F11	69	01:20:19	01:21:55	1.90	5.72	2048	9	B	2	
F12	69	01:21:49	01:23:25	1.90	5.72	2048	8	B	2	
F13	69	01:23:19	01:24:55	1.90	5.72	2048	7	B	2	

CRREL.1

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F14	69	01:24:49	01:26:25	1.90	5.72	2048	13	B	2	
F15	69	01:26:19	01:27:55	1.90	5.72	2048	8	B	2	HARDING LAKE-O
F16	69	01:27:49	01:29:32	1.90	5.72	2048	9	B	2	
F17	69	01:29:26	01:30:57	1.90	5.72	2048	8	B	3	
F18	69	01:30:51	01:32:22	1.90	5.72	2048	7	B	3	
F19	69	01:32:16	01:33:47	1.90	5.72	2048	9	B	3	
F20	69	01:33:41	01:35:12	1.90	5.72	2048	8	B	3	LAKE - 1500
F21	69	01:35:06	01:36:02	1.90	5.72	2048	--	B	3	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	69	01:49:31	02:54:18	1.90	5.72	2048	11	B	4	
F2	69	02:54:12	02:58:52	1.90	5.72	2048	7	B	4	
F3	69	02:58:46	03:03:27	1.90	5.72	2048	12	B	4	
F4	69	03:03:21	03:08:02	1.90	5.72	2048	9	B	4	KOTZEBUE (LINE 100)
F5	69	03:07:56	03:12:35	1.90	5.72	2048	5	B	4	
F6	69	03:12:29	01:17:10	1.90	5.72	2048	14	B	4	
F7	69	03:17:04	03:21:44	1.90	5.72	2048	8	B	4	
F8	69	03:21:38	03:29:25	1.90	5.72	2048	7	B	4	*
F9	69	03:29:19	03:33:42	1.90	5.72	2048	8	B	4	
F10	69	03:33:36	03:38:00	1.90	5.72	2048	5	B	4	
F11	69	03:38:54	03:42:21	1.90	5.72	3048	10	B	4	

*TIME GAP IN FILE: 03:22:42 - 03:25:54 IS MISSING

CAPE LISBURNE MOSAIC

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	69	03:38:54	03:43:20	1.90	5.72	2048	6	B	5	LINE 1 START
F2	69	03:43:14	03:47:40	1.90	5.72	2048	8	B	5	LINE 1
F3	69	03:47:34	03:51:59	1.90	5.72	2048	6	B	5	LINE 1
F4	69	03:51:53	03:56:19	1.90	5.72	2048	11	B	5	LINE 1
F5	69	03:56:13	04:03:55	1.90	5.72	2048	11	B	5	LINE 1 END
F6	69	04:03:28	04:09:11	1.90	5.72	2048	15	B	5	LINE 2 START
F7	69	04:09:05	04:11:24	1.90	5.72	2048	14	B	5	LINE 2
F8	69	04:14:18	04:19:37	1.90	5.72	2048	11	B	5	LINE 2
F9	69	04:19:31	04:24:50	1.90	5.72	2048	13	B	5	LINE 2
F10	69	04:24:44	04:33:21	1.90	5.72	2048	38	B	5	LINE 2 END
F11	69	04:32:30	04:37:00	1.90	5.72	2048	6	B	6	LINE 3 START
F12	69	04:36:54	04:41:22	1.90	5.72	2048	5	B	6	LINE 3
F13	69	04:41:16	04:45:45	1.90	5.72	2048	8	B	6	LINE 3

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F14	69	04:45:39	04:50:09	1.90	5.72	2048	7	B	6	LINE 3 START
F15	69	04:50:03	04:57:07	1.90	5.72	2048	12	B	6	LINE 3 END
F16	69	04:55:49	05:01:16	1.90	5.72	2048	12	B	6	LINE 4 START
F17	69	05:01:10	05:06:28	1.90	5.72	2048	13	B	6	LINE 4
F18	69	05:06:22	05:11:40	1.90	5.72	2048	12	B	6	LINE 4
F19	69	05:11:34	05:16:51	1.90	5.72	2048	8	B	6	LINE 4
F20	69	05:16:45	05:24:23	1.90	5.72	2048	14	B	6	LINE 4 END
F21	69	05:23:24	05:27:44	1.90	5.72	2048	8	B	7	LINE 5 START
F22	69	05:27:38	05:31:59	1.90	5.72	2048	9	B	7	LINE 5
F23	69	05:31:53	05:36:12	1.90	5.72	2048	6	B	7	LINE 5
F24	69	05:31:06	06:40:24	1.90	5.72	2048	1	B	7	LINE 5
F25	69	05:40:18	05:44:37	1.90	5.72	2048	5	B	7	LINE 5
F26	69	05:44:31	05:46:18	1.90	5.72	2048	6	B	7	LINE 5 END

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F27	69	05:58:14	06:02:58	1.90	5.72	2048	10	C	7	
F28	69	06:02:52	06:07:52	1.90	5.72	2048	10	C	7	
F29	69	06:06:35	06:11:35	1.90	5.72	2048	10	C	7	LINE 6 START
F30	69	06:11:29	06:16:30	1.90	5.72	2048	12	C	7	LINE 6
F31	69	06:16:24	06:21:25	1.90	5.72	2048	14	C	7	LINE 6
F32	69	06:21:19	06:26:19	1.90	5.72	2048	8	C	7	LINE 6
F33	69	06:26:13	06:31:14	1.90	5.72	2048	15	C	7	LINE 6
F34	69	06:31:08	06:32:20	1.90	5.72	2048	--	C	7	LINE 6 END
F35	69	06:35:36	06:39:56	1.90	5.72	2048	6	C	8	LINE 7 START
F36	69	06:39:50	06:44:10	1.90	5.72	2048	6	C	8	LINE 7
F37	69	06:44:04	06:48:24	1.90	5.72	2048	8	C	8	LINE 7
F38	69	06:48:18	06:52:38	1.90	5.72	2048	8	C	8	LINE 7
F39	69	06:52:32	07:00:00	1.90	5.72	2048	7	C	8	LINE 7 END

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F40	69	06:58:40	07:03:53	1.90	5.72	2048	12	C	8	LINE 8 START
F41	69	07:03:47	07:08:59	1.90	5.72	2048	10	C	8	LINE 8
F42	69	07:08:53	07:14:05	1.90	5.72	2048	8	C	8	LINE 8
F43	69	07:13:59	07:19:12	1.90	5.72	2048	13	C	8	LINE 8
F44	69	07:19:06	07:24:19	1.90	5.72	2048	9	C	8	LINE 8
F45	69	07:24:13	07:24:28	1.90	5.72	2048	--	C	8	LINE 8 END
F46	69	07:26:52	07:31:09	1.90	5.72	2048	9	C	8	LINE 9 START
F47	69	07:31:03	07:35:19	1.90	5.72	2048	3	C	9	LINE 9
F48	69	07:35:13	07:39:32	1.90	5.72	2048	9	C	9	LINE 9
F49	69	07:39:26	07:43:42	1.90	5.72	2048	--	C	4	LINE 9
F50	69	07:43:36	07:47:10	1.90	5.72	2048	--	C	9	LINE 9 END
F51	69	07:49:50	07:55:00	1.90	5.72	2048	11	C	9	LINE 10 START
F52	69	07:54:54	08:00:05	1.90	5.72	2048	11	C	9	LINE 10
F53	69	07:59:59	08:05:09	1.90	5.72	2048	7	C	9	LINE 10

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F54	69	08:05:03	08:10:15	1.90	5.72	2048	10	C	9	LINE 10
F55	69	08:10:09	08:14:03	1.90	5.72	2048	10	C	9	LINE 10 END
F56	69	08:15:45	08:19:57	1.90	5.72	2048	3	C	10	LINE 11 START
F57	69	08:19:51	08:24:02	1.90	5.72	2048	3	C	10	LINE 11
F58	69	08:23:56	08:25:18	1.90	5.72	2048	3	C	10	LINE 11 END
F59	69	08:27:12	08:32:25	1.90	5.72	2048	6	C	10	LINE 12 START
F60	69	08:32:19	08:37:07	1.90	5.72	2048	9	C	10	LINE 12 END

BEAUFORT TRANSECT

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	71	16:04:50	16:09:13	1.90	5.72	2048	5	D	11	
F2	71	16:09:07	16:13:30	1.90	5.72	2048	6	D	11	
F3	71	16:13:32	16:18:02	1.90	5.72	2048	4	D	11	
F4	71	16:17:56	16:22:26	1.90	5.72	2048	7	D	11	
F5	71	16:22:20	16:26:50	1.90	5.72	2048	10	D	11	
F6	71	16:26:44	16:31:14	1.90	5.72	2048	6	D	11	
F7	71	16:31:08	16:35:38	1.90	5.72	2048	7	D	11	
F8	71	16:35:30	16:39:55	1.90	5.72	2048	7	D	11	
F9	71	16:39:49	16:44:12	1.90	5.72	2048	7	D	11	
F10	71	16:44:06	16:48:30	1.90	5.72	2048	6	D	11	
F11	71	16:48:24	16:52:47	1.90	5.72	2048	6	D	12	
F12	71	16:52:41	16:57:03	1.90	5.72	2048	4	D	12	
F13	71	16:56:57	17:01:20	1.90	5.72	2048	7	D	12	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F14	71	17:01:14	17:05:36	1.90	5.72	2048	2	D	12	
F15	71	17:05:30	17:09:52	1.90	5.72	2048	5	D	12	
F16	71	17:09:46	17:14:08	1.90	5.72	2048	3	D	12	
F17	71	17:14:06	17:18:29	1.90	5.72	2048	4	D	12	
F18	71	17:18:26	17:22:42	1.90	5.72	2048	3	D	12	
F19	71	17:22:36	17:26:41	1.90	5.72	2048	5	D	12	
F20	71	17:26:35	16:30:40	1.90	5.72	2048	3	D	12	
F21	71	17:30:34	17:34:39	1.90	5.72	2048	6	D	13	
F22	71	17:34:33	17:38:38	1.90	5.72	2048	8	D	13	
F23	71	17:38:32	17:42:38	1.90	5.72	2048	4	D	13	
F24	71	17:42:32	17:46:28	1.90	5.72	2048	4	D	13	
F25	71	17:46:22	17:50:12	1.90	5.72	2048	1	D	13	
F26	71	17:50:06	17:53:57	1.90	5.72	2048	3	D	13	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F27	71	17:53:51	17:57:42	1.90	5.72	2048	3	D	13	
F28	71	17:57:36	18:02:05	1.90	5.72	2048	4	D	13	
F29	71	18:01:59	18:06:04	1.90	5.72	2048	3	D	13	
F30	71	18:05:58	18:10:01	1.90	5.72	2048	2	D	13	
F31	71	18:09:55	18:14:07	1.90	5.72	2048	5	D	14	
F32	71	18:14:01	18:19:17	1.90	5.72	2048	6	D	14	
F33	71	18:19:11	18:24:25	1.90	5.72	2048	8	D	14	
F34	71	18:24:19	18:39:34	1.90	5.72	2048	10	D	14	
F35	71	18:29:28	18:34:43	1.90	5.72	2048	8	D	14	
F36	71	18:34:37	18:39:28	1.90	5.72	2048	8	D	14	
F37	71	18:39:22	18:43:26	1.90	5.72	2048	3	D	14	
F38	71	18:43:20	18:47:24	1.90	5.72	2048	2	D	14	
F39	71	18:47:18	18:51:22	1.90	5.72	2048	3	D	14	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F40	71	18:51:16	18:55:20	1.90	5.72	2048	7	D	14	
F41	71	18:55:14	18:59:18	1.90	5.72	2048	3	D	15	
F42	71	18:59:12	19:03:16	1.90	5.72	2048	2	D	15	
F43	71	19:03:10	19:07:14	1.90	5.72	2048	3	D	15	
F44	71	19:07:08	19:11:12	1.90	5.72	2048	2	D	15	
F45	71	19:11:06	19:15:10	1.90	5.72	2048	5	D	15	
F46	71	19:15:04	19:19:09	1.90	5.72	2048	8	D	15	
F47	71	19:19:03	19:23:07	1.90	5.72	2048	3	D	15	
F48	71	19:23:01	19:27:04	1.90	5.72	2048	2	D	15	
F49	71	19:26:58	19:31:02	1.90	5.72	2048	4	D	15	
F50	71	19:30:56	19:34:59	1.90	5.72	2048	5	D	15	
F51	71	19:34:53	19:38:56	1.90	5.72	2048	2	D	16	
F52	71	19:38:50	19:42:53	1.90	5.72	2048	4	D	16	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F53	71	19:42:37	19:46:50	1.90	5.72	2048	2	D	16	
F54	71	19.46:44	19:50:47	1.90	5.72	2048	3	D	16	END OF OUT BOUND LINE
F55	71	20:07:06	20:11:48	1.90	5.72	2048	4	E	16	START IN-BOUND LINE
F56	71	20:11:42	20:16:29	1.90	5.72	2048	6	E	16	
F57	71	20:16:23	20:21:31	1.90	5.72	2048	9	E	16	
F58	71	20:21:25	20:26:33	1.90	5.72	2048	6	E	16	
F59	71	20:26:27	20:31:35	1.90	5.72	2048	5	E	16	
F60	71	20:31:29	20:36:36	1.90	5.72	2048	14	E	16	
F61	71	20:36:30	20:41:38	1.90	5.72	2048	4	E	16	
F62	71	20:41:32	20:46:40	1.90	5.72	2048	5	E	16	
F63	71	20:46:34	20:51:41	1.90	5.72	2048	5	E	16	
F64	71	20:51:35	20:56:43	1.90	5.72	2048	7	E	17	
F65	71	20:56:37	21:01:45	1.90	5.72	2048	7	E	17	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F66	71	21:01:39	21:06:47	1.90	5.72	2048	5	E	17	
F67	71	21:06:41	21:11:50	1.90	5.72	2048	6	E	17	
F68	71	21:11:64	21:17:03	1.90	5.72	2048	4	E	17	
F69	71	21:16:57	21:22:06	1.90	5.72	2048	6	E	17	
F70	71	21:22:00	21:27:09	1.90	5.72	2048	4	E	17	
F71	71	21:27:03	21:32:14	1.90	5.72	2048	4	E	18	
F72	71	21:32:08	21:37:17	1.90	5.72	2048	7	E	18	
F73	71	21:37:11	21:42:20	1.90	5.72	2048	3	E	18	
F74	71	21:42:14	21:47:23	1.90	5.72	2048	20	E	18	OPEN WATER DROPOUTS
F75	71	21:47:17	21:52:26	1.90	5.72	2048	5	E	18	
F76	71	21:52:20	21:57:29	1.90	5.72	2048	13	E	18	
F77	71	21:57:23	22:02:43	1.90	5.72	2048	11	E	18	
F78	71	22:02:36	22:08:26	1.90	5.72	2048	9	E	18	

BEAUFORT TRANSECT

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F79	71	22:08:20	22:14:11	1.90	5.72	2048	13	E	18	
F80	71	22:14:05	22:19:55	1.90	5.72	2048	8	E	18	
F81	71	22:19:49	22:25:39	1.90	5.72	2048	9	E	19	
F82	71	22:25:33	22:31:03	1.90	5.72	2048	10	E	19	
F83	71	22:30:57	22:36:13	1.90	5.72	2048	21	E	19	
F84	71	22:36:07	22:41:21	1.90	5.72	2048	10	E	19	
F85	71	22:41:15	22:46:29	1.90	5.72	2048	18	E	19	
F86	71	22:46:23	22:51:37	1.90	5.72	2048	19	E	19	
F87	71	22:51:31	22:56:44	1.90	5.72	2048	8	E	19	
F88	71	22:56:38	23:01:51	1.90	5.72	2048	6	E	19	
F89	71	23:01:45	23:06:58	1.90	5.72	2048	13	E	19	
F90	71	23:06:52	23:12:07	1.90	5.72	2048	13	E	19	
F91	71	23:12:01	23:17:09	1.90	5.72	2048	4	E	20	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F92	71	23:17:03	23:21:53	1.90	5.72	2048	5	E	20	
F93	71	23:21:47	23:26:39	1.90	5.72	2048	12	E	20	
F94	71	23:26:33	23:31:24	1.90	5.72	2048	10	E	20	
F95	71	23:31:18	23:36:10	1.90	5.72	2048	9	E	20	
F96	71	23:36:04	23:40:48	1.90	5.72	2048	9	E	20	
F97	71	23:40:42	23:45:11	1.90	5.72	2048	9	E	20	
F98	71	23:45:05	23:49:32	1.90	5.72	2048	10	E	20	
F99	71	23:49:26	23:53:56	1.90	5.72	2048	10	E	20	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	72	00:52:15	00:53:51	1.90	5.72	2048	8	F	21	
F2	72	00:53:45	00:55:22	1.90	5.72	2048	8	F	21	
F3	72	00:55:16	00:56:54	1.90	5.72	2048	6	F	21	
F4	72	00:56:48	00:58:26	1.90	5.72	2048	5	F	21	
F5	72	00:58:22	00:59:59	1.90	5.72	2048	5	F	21	
F6	72	00:59:53	01:01:31	1.90	5.72	2048	5	F	21	
F7	72	01:01:26	01:03:09	1.90	5.72	2048	5	F	21	
F8	72	01:02:55	01:04:23	1.90	5.72	2048	8	F	21	
F9	72	01:04:17	01:05:34	1.90	5.72	2048	9	F	21	
F10	72	01:05:28	01:06:52	1.90	5.72	2048	10	F	21	
F11	72	01:06:46	01:08:10	1.90	5.72	2048	8	F	22	
F12	72	01:08:04	01:09:28	1.90	5.72	2048	7	F	22	
F13	72	01:09:22	01:11:24	1.90	5.72	2048	10	F	22	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F14	72	01:11:18	01:12:50	1.90	5.72	2048	8	F	22	
F15	72	01:12:44	01:14:16	1.90	5.72	2048	8	F	22	
F16	72	01:14:10	01:15:42	1.90	5.72	2048	10	F	22	
F17	72	01:15:36	01:17:08	1.90	5.72	2048	9	F	22	
F18	72	01:17:02	01:18:34	1.90	5.72	2048	10	F	22	
F19	72	01:18:28	01:20:00	1.90	5.72	2048	7	F	22	
F20	72	01:19:54	01:21:26	1.90	5.72	2048	9	F	22	
F21	72	01:21:20	01:22:52	1.90	5.72	2048	7	F	23	
F22	72	01:22:46	01:24:18	1.90	5.72	2048	9	F	23	
F23	72	01:24:12	01:25:44	1.90	5.72	2048	9	F	23	
F24	72	01:25:38	01:27:10	1.90	5.72	2048	7	F	23	
F25	72	01:27:04	01:28:36	1.90	5.72	2048	9	F	23	
F26	72	01:28:30	01:30:02	1.90	5.72	2048	8	F	23	

CRREL,2

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F27	72	01:29:56	01:31:28	1.90	5.72	2048	9	F	23	
F28	72	01:31:22	01:32:54	1.90	5.72	2048	8	F	23	
F29	72	01:32:48	01:33:00	1.90	5.72	2048	0	F	23	

BERING TRANSIT,1

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	73	16:30:06	16:34:44	1.82	5.67	2048	3	G	24	LAND
F2	73	16:34:39	16:39:29	1.82	5.67	2048	3	G	24	COAST @ 250
F3	73	16:39:15	16:43:55	1.82	5.67	2048	8	G	24	LAND
F4	73	16:43:50	16:48:29	1.82	5.67	2048	5	G	24	
F5	73	16:48:24	16:53:04	1.82	5.67	2048	7	G	24	
F6	73	16:52:59	16:57:38	1.82	5.67	2048	3	G	24	
F7	73	16:57:33	17:02:13	1.82	5.67	2048	6	G	24	
F8	73	16:02:08	17:06:48	1.82	5.67	2048	9	G	24	
F9	73	17:06:43	17:11:22	1.82	5.67	2048	8	G	24	
F10	73	17:11:17	17:15:55	1.82	5.67	2048	2	G	24	
F11	73	17:15:50	17:20:28	1.82	5.67	2048	4	G	25	
F12	73	17:20:23	17:25:01	1.82	5.67	2048	3	G	25	
F13	73	17:24:56	17:29:34	1.82	5.67	2048	4	G	25	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	73	17:26:00	17:30:37	1.82	5.67	2048	1	G	26	LINE 1 START
F2	73	17:30:32	17:35:10	1.82	5.67	2048	6	G	26	LINE 1
F3	73	17:35:05	17:39:43	1.82	5.67	2048	4	G	26	LINE 1
F4	73	17:39:38	17:44:15	1.82	5.67	2048	5	G	26	LINE 1
F5	73	17:44:10	17:49:01	1.82	5.67	2048	5	G	26	LINE 1
F6	73	17:48:56	17:54:11	1.82	5.67	2048	17	G	26	LINE 1
F7	73	17:54:06	17:59:19	1.82	5.67	2048	3	G	26	LINE 1
F8	73	17:59:14	18:04:28	1.82	5.67	2048	9	G	26	LINE 1
F9	73	18:04:23	18:12:04	1.82	5.67	2048	5	G	26	LINE 1 END
F10	73	18:10:50	18:15:19	1.82	5.67	2048	5	G	27	LINE 2 START
F11	73	18:15:14	18:19:43	1.82	5.67	2048	9	G	27	LINE 2
F12	73	18:19:38	18:24:07	1.82	5.67	2048	6	G	27	LINE 2
F13	73	18:24:02	18:28:30	1.82	5.67	2048	4	G	27	LINE 2

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F14	73	18:28:25	18:32:54	1.82	5.67	2048	8	G	27	LINE 2
F15	73	18:32:49	18:37:19	1.82	5.67	2048	11	G	27	LINE 2
F16	73	18:37:14	18:41:43	1.82	5.67	2048	0	G	27	LINE 2 START
F17	73	18:41:39	18:46:07	1.82	5.67	2048	7	G	27	LINE 2
F18	73	18:46:02	18:50:33	1.82	5.67	2048	10	G	27	LINE 2 END
F19	73	18:54:05	18:58:53	1.82	5.67	2048	7	G	28	LINE 3 START
F20	73	18:58:48	19:03:35	1.82	5.67	2048	11	G	28	LINE 3
F21	73	19:03:30	19:08:17	1.82	5.67	2048	5	G	28	LINE 3
F22	73	19:08:12	19:12:57	1.82	5.67	2048	8	G	28	LINE 3
F23	73	19:12:52	19:17:41	1.82	5.67	2048	9	G	28	LINE 3
F24	73	19:17:36	19:22:45	1.82	5.67	2048	11	G	11	LINE 3
F25	73	19:22:40	19:27:50	1.82	5.67	2048	12	G	28	LINE 3
F26	73	19:27:45	19:32:52	1.82	5.67	2048	9	G	9	LINE 3

BERING MOSAIC

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F27	73	19:32:47	19:41:00	1.82	5.67	2048	9	G	28	LINE 3 END
F28	73	19:40:01	19:44:30	1.82	5.67	2048	3	G	29	LINE 4 START
F29	73	19:44:25	19:48:54	1.82	5.67	2048	5	G	29	LINE 4
F30	73	19:48:49	19:53:19	1.82	5.67	2048	12	G	29	LINE 4
F31	73	19:53:14	19:57:43	1.82	5.67	2048	8	G	29	LINE 4
F32	73	19:57:38	20:02:07	1.82	5.67	2048	8	G	29	LINE 4
F33	73	20:02:02	20:06:32	1.82	5.67	2048	11	G	29	LINE 4
F34	73	20:06:27	20:10:56	1.82	5.67	2048	7	G	29	LINE 4
F35	73	20:10:51	20:15:03	1.82	5.67	2048	133	G	29	LINE 4 END
F36	73	20:27:14	20:32:25	1.82	5.67	2048	11	H	30	LINE 5 START
F37	73	20:32:20	20:37:30	1.82	5.67	2048	8	H	30	LINE 5
F38	73	20:37:25	20:42:35	1.82	5.67	2048	10	H	30	LINE 5
F39	73	20:42:30	20:47:40	1.82	5.67	2048	11	H	30	LINE 5

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F40	73	20:47:35	20:52:46	1.82	5.67	2048	14	H	30	LINE 5
F41	73	20:52:41	20:57:50	1.82	5.67	2048	6	H	30	LINE 5
F42	73	20:57:45	21:02:54	1.82	5.67	2048	11	H	30	LINE 5
F43	73	21:02:49	21:06:53	1.82	5.67	2048	118	H	30	LINE 5 END

BERING TRANSIT.2
(LOW ALTITUDE)

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	73	21:14:56	21:16:46	1.82	5.67	2048	5	H	31	*
F2	73	21:16:41	21:18:05	1.82	5.67	2048	8	H	31	
F3	73	21:18:00	21:19:24	1.82	5.67	2048	9	H	31	
F4	73	21:19:19	21:20:43	1.82	5.67	2048	8	H	31	
F5	73	21:20:38	21:22:02	1.82	5.67	2048	7	H	31	
F6	73	21:21:57	21:23:21	1.82	5.67	2048	9	H	31	
F7	73	21:23:16	21:24:39	1.82	5.67	2048	8	H	31	
F8	73	21:24:34	21:25:58	1.82	5.67	2048	9	H	31	
F9	73	21:25:53	21:27:12	1.82	5.67	2048	49	H	31	

* ALL DATA ACQUIRED AT LOW ALTITUDE (5K' - 6K') AND AT EXTREMELY RAPID SCAN RATE

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	73	21:35:01	21:39:22	1.82	5.67	2048	8	H	32	
F2	73	21:39:17	21:43:37	1.82	5.67	2048	9	H	32	
F3	73	21:43:32	21:47:50	1.82	5.67	2048	8	H	32	
F4	73	21:47:45	21:52:02	1.82	5.67	2048	3	H	32	
F5	73	21:51:57	21:56:14	1.82	5.67	2048	6	H	32	
F6	73	21:56:09	22:00:25	1.82	5.67	2048	6	H	32	
F7	73	22:00:20	22:04:37	1.82	5.67	2048	9	H	32	
F8	73	22:04:32	22:08:49	1.82	5.67	2048	5	H	32	
F9	73	22:08:44	22:13:00	1.82	5.67	2048	5	H	32	
F10	73	22:12:55	22:17:12	1.82	5.67	2048	4	H	33	
F11	73	22:17:07	22:21:23	1.82	5.67	2048	6	H	33	
F12	73	22:21:18	22:25:35	1.82	5.67	2048	6	H	33	
F13	73	22:25:30	22:29:47	1.82	5.67	2048	7	H	33	

BERING TRANSIT.3

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F14	72	22:29:42	22:33:59	1.82	5.67	2048	5	H	33	
F15	73	22:33:54	22:38:12	1.82	5.67	2048	8	H	33	
F16	73	22:38:07	22:40:35	1.82	5.67	2048	6	H	33	

CHUKCHI TRANSIT.1

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	74	19:15:00	19:18:53	1.82	5.67	2048		I	34	
F2	74	19:18:48	19:22:39	1.82	5.67	2048		I	34	
F3	74	19:22:34	19:26:25	1.82	5.67	2048		I	34	
F4	74	19:26:20	19:30:12	1.82	5.67	2048		I	34	
F5	74	19:30:07	19:33:58	1.82	5.67	2048		I	34	
F6	74	19:33:53	19:37:44	1.82	5.67	2048		I	34	
F7	74	19:37:39	19:41:50	1.82	5.67	2048		I	35	
F8	74	19:41:45	19:46:15	1.82	5.67	2048		I	35	
F9	74	19:46:10	19:50:40	1.82	5.67	2048		I	35	
F10	74	19:50:35	19:55:05	1.82	5.67	2048		I	35	
F11	74	19:55:00	19:59:29	1.82	5.67	2048		I	35	
F12	74	19:59:24	20:03:54	1.82	5.67	2048		I	35	

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	74	20:03:49	20:08:18	1.82	5.67	2048	6	I	36	LINE 1
F2	74	20:08:13	20:12:36	1.82	5.67	2048	3	I	36	LINE 1
F3	74	20:12:31	20:16:54	1.82	5.67	2048	4	I	36	LINE 1
F4	74	20:16:49	20:21:11	1.82	5.67	2048	4	I	36	LINE 1
F5	74	20:21:06	20:25:29	1.82	5.67	2048	4	I	36	LINE 1
F6	74	20:25:24	20:27:46	1.82	5.67	2048	4	I	36	LINE 1
F7	74	20:29:41	20:31:25	1.82	5.67	2048	701	I	36	LINE 1
F8	74	20:34:15	20:39:22	1.82	5.67	2048	5	I	37	LINE 2
F9	74	20:39:17	20:44:23	1.82	5.67	2048	8	I	37	LINE 2
F10	74	20:44:18	20:49:25	1.82	5.67	2048	7	I	37	LINE 2
F11	74	20:49:20	20:54:27	1.82	5.67	2048	8	I	37	LINE 2
F12	74	20:54:22	20:59:28	1.82	5.67	2048	8	I	37	LINE 2
F13	74	20:59:23	21:04:30	1.82	5.67	2048	12	I	37	LINE 2

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F14	74	21:04:25	21:05:10	1.82	5.67	2048	1614	I	37	LINE 2
F15	74	21:08:03	21:12:26	1.82	5.67	2048	3	I	38	LINE 3
F16	74	21:12:21	21:16:45	1.82	5.67	2048	9	I	38	LINE 3
F17	74	21:16:40	21:21:03	1.82	5.67	2048	3	I	38	LINE 3
F18	74	21:20:58	21:25:21	1.82	5.67	2048	3	I	38	LINE 3
F19	74	21:25:16	21:29:40	1.82	5.67	2048	6	I	38	LINE 3
F20	74	21:29:35	21:33:58	1.82	5.67	2048	2	I	38	LINE 3
F21	74	21:33:53	21:36:04	1.82	5.67	2048	860	I	38	LINE 3
F22	74	21:39:21	21:44:24	1.82	5.67	2048	5	I	39	LINE 4
F23	74	21:44:19	21:49:22	1.82	5.67	2048	5	I	39	LINE 4
F24	74	21:49:17	21:54:20	1.82	5.67	2048	6	I	39	LINE 4
F25	74	21:54:15	21:59:18	1.82	5.67	2048	4	I	39	LINE 4
F26	74	21:59:13	22:04:16	1.82	5.67	2048	9	I	39	LINE 4

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F27	74	22:04:11	22:09:14	1.82	5.67	2048	10	I	39	LINE 4
F28	74	22:09:09	23:11:17	1.82	5.67	2048	730	I	39	LINE 4
F29	74	22:14:02	22:18:22	1.82	5.67	2048	3	I	40	LINE 5
F30	74	22:18:17	22:22:37	1.82	5.67	2048	8	I	40	LINE 5
F31	74	22:22:32	22:26:52	1.82	5.67	2048	5	I	40	LINE 5
F32	74	22:26:47	22:31:07	1.82	5.67	2048	7	I	40	LINE 5
F33	74	22:31:02	22:35:22	1.82	5.67	2048	6	I	40	LINE 5
F34	74	22:35:17	22:39:36	1.82	5.67	2048	7	I	40	LINE 5
F35	74	22:39:31	22:42:05	1.82	5.67	2048	443	I	40	LINE 5
F36	74	22:45:04	22:50:08	1.82	5.67	2048	8	I	41	LINE 6
F37	74	22:50:03	22:55:06	1.82	5.67	2048	4	I	41	LINE 6
F38	74	22:55:01	23:00:04	1.82	5.67	2048	10	I	41	LINE 6
F39	74	22:59:59	23:05:01	1.82	5.67	2048	5	I	41	LINE 6

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F40	74	23:04:56	23:09:59	1.82	5.67	2048	6	I	41	LINE 6
F41	74	23:09:54	23:14:57	1.82	5.67	2048	6	I	41	LINE 6
F42	74	23:14:52	23:17:23	1.82	5.67	2048	2	I	41	LINE 6

CHUKCHI LOW ALTITUDE

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	74	23:37:04	23:38:32	1.82	5.67	2048		J	42	DIAGONAL LINE
F2	74	23:38:27	23:39:53	1.82	5.67	2048		J	42	DIAGONAL LINE
F3	74	23:39:48	23:41:13	1.82	5.67	2048		J	42	DIAGONAL LINE
F4	74	23:41:07	23:42:32	1.82	5.67	2048		J	42	DIAGONAL LINE
F5	74	23:42:27	23:43:52	1.82	5.67	2048		J	42	DIAGONAL LINE
F6	74	23:43:47	23:45:13	1.82	5.67	2048		J	42	DIAGONAL LINE
F7	74	23:45:08	23:46:34	1.82	5.67	2048		J	42	DIAGONAL LINE
F8	74	23:46:29	23:47:55	1.82	5.67	2048		J	42	DIAGONAL LINE
F9	74	23:47:50	23:49:15	1.82	5.67	2048		J	42	DIAGONAL LINE
F10	74	23:49:10	23:50:35	1.82	5.67	2048		J	42	DIAGONAL LINE
F11	74	23:50:30	23:51:56	1.82	5.67	2048		J	43	DIAGONAL LINE
F12	74	23:51:51	23:53:17	1.82	5.67	2048		J	43	DIAGONAL LINE
F13	74	23:53:12	23:54:38	1.82	5.67	2048		J	43	DIAGONAL LINE

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F14	74	23:54:33	23:55:30	1.82	5.67	2048		J	43	DIAGONAL LINE (END)
F15	74	23:57:26	23:58:51	1.82	5.67	2048		J	43	PERPENDIC-ULAR LINE
F16	74/75	23:58:46	00:00:10	1.82	5.67	2048		J	43	PERPENDIC-ULAR LINE
F17	75	00:00:05	00:01:29	1.82	5.67	2048		J	43	PERPENDIC-ULAR LINE
F18	75	00:01:24	00:02:48	1.82	5.67	2048		J	43	PERPENDIC-ULAR LINE
F19	75	00:02:43	00:03:33	1.82	5.67	2048		J	43	PERPENDIC-ULAR LINE

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F1	75	00:12:09	00:17:00	1.82	5.67	2048		J	44	SEA ICE
F2	75	00:16:55	00:21:45	1.82	5.67	2048		J	44	SEA ICE
F3	75	00:21:40	00:26:29	1.82	5.67	2048		J	44	SEA ICE
F4	75	00:26:24	00:31:14	1.82	5.67	2048		J	44	SEA ICE
F5	75	00:31:09	00:35:59	1.82	5.67	2048		J	44	SEA ICE
F6	75	00:35:54	00:41:15	1.82	5.67	2048		J	44	SEA ICE
F7	75	00:41:10	00:46:37	1.82	5.67	2048		J	44	SEA ICE
F8	75	00:46:32	00:51:57	1.82	5.67	2048		J	44	SEA ICE
F9	75	00:51:52	00:57:17	1.82	5.67	2048		J	44	SEA ICE
F10	75	00:57:12	01:02:37	1.82	5.67	2048		J	45	LAND
F11	75	01:02:32	01:07:56	1.82	5.67	2048		J	45	LAND
F12	75	01:07:51	01:13:17	1.82	5.67	2048		J	45	LAND
F13	75	01:13:12	01:18:36	1.82	5.67	2048		J	45	LAND

IMAGE NAME	JULIAN DAY	GMT START	GMT STOP	GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO ANA.	TAPE NO DIG.	COMMENTS
F14	75	01:18:31	01:23:56	1.82	5.67	2048		J	45	LAND
F15	75	01:23:51	01:29:18	1.82	5.67	2048		J	45	LAND
F16	75	01:29:13	01:34:38	1.82	5.67	2048		J	45	LAND
F17	75	01:34:33	01:39:57	1.82	5.67	2048		J	45	LAND

APPENDIX B: INDEX TO dd FORMAT TAPES

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
1	1	CRREL.1.f11	69	01:20:19	01:21:55
1	2	CRREL.1.f12	69	01:21:49	01:23:25
1	3	CRREL.1.f13	69	01:23:19	01:24:55
1	4	CRREL.1.f14	69	01:24:49	01:26:25
1	5	CRREL.1.f15	69	01:26:19	01:27:55
1	6	CRREL.1.f16	69	01:27:49	01:29:32
1	7	CRREL.1.f17	69	01:29:26	01:30:57
1	8	CRREL.1.f18	69	01:30:51	01:32:22
1	9	CRREL.1.f19	69	01:32:16	01:33:47
1	10	CRREL.1.f20	69	01:33:41	01:35:12

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
2	1	CRREL.1.f1	69	01:05:18	01:06:53
2	2	CRREL.1.f2	69	01:06:47	01:08:24
2	3	CRREL.1.f3	69	01:08:19	01:09:55
2	4	CRREL.1.f4	69	01:09:49	01:11:25
2	5	CRREL.1.f5	69	01:11:19	01:12:55
2	6	CRREL.1.f6	69	01:12:49	01:14:25
2	7	CRREL.1.f7	69	01:14:19	01:15:55
2	8	CRREL.1.f8	69	01:15:49	01:17:25
2	9	CRREL.1.f9	69	01:17:19	01:18:55
2	10	CRREL.1.f10	69	01:18:49	01:20:25

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
3	1	CRREL.1.f21	69	01:35:06	01:36:22
3	2	CRREL.2.f1	72	00:52:15	00:53:51
3	3	CRREL.2.f2	72	00:53:45	00:55:22
3	4	CRREL.2.f3	72	00:55:16	00:56:54
3	5	CRREL.2.f4	72	00:56:48	00:58:26
3	6	CRREL.2.f5	72	00:58:22	00:59:59
3	7	CRREL.2.f6	72	00:59:53	01:01:32
3	8	CRREL.2.f7	72	01:01:26	01:03:09
3	9	CRREL.2.f8	72	01:02:55	01:04:23
3	10	CRREL.2.f9	72	01:04:17	01:05:34

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
4	1	CRREL.2.f10	72	01:05:28	01:06:52
4	2	CRREL.2.f11	72	01:06:46	01:08:10
4	3	CRREL.2.f12	72	01:08:04	01:09:28
4	4	CRREL.2.f13	72	01:09:22	01:11:24
4	5	CRREL.2.f14	72	01:11:18	01:12:50
4	6	CRREL.2.f15	72	01:12:44	01:14:16
4	7	CRREL.2.f16	72	01:14:10	01:15:42
4	8	CRREL.2.f17	72	01:15:36	01:17:08
4	9	CRREL.2.f18	72	01:17:02	01:18:34
4	10	CRREL.2.f19	72	01:18:28	01:20:00

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
5	1	CRREL.2.f20	72	01:19:54	01:21:26
5	2	CRREL.2.f21	72	01:21:20	01:22:52
5	3	CRREL.2.f22	72	01:22:46	01:24:18
5	4	CRREL.2.f23	72	01:24:12	01:25:44
5	5	CRREL.2.f24	72	01:25:38	01:27:10
5	6	CRREL.2.f25	72	01:27:04	01:28:36
5	7	CRREL.2.f26	72	01:28:30	01:30:02
5	8	CRREL.2.f27	72	01:29:56	01:31:28
5	9	CRREL.2.f28	72	01:31:22	01:32:54
5	10	CRREL.2.f29	72	01:32:48	01:33:00

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
6	1	TRANSIT.1.f1	66	21:52:30	21:59:32
6	2	TRANSIT.1.f2	66	21:59:27	22:04:28
6	3	TRANSIT.1.f3	66	21:04:23	22:09:37
6	4	TRANSIT.1.f4	66	21:09:30	22:15:02
6	5	TRANSIT.1.f5	66	22:14:55	22:20:27
6	6	TRANSIT.1.f6	66	22:20:20	22:25:53
6	7	TRANSIT.1.f7	66	22:25:46	22:31:19
6	8	TRANSIT.1.f8	66	22:31:12	22:36:44

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
7	1	TRANSIT.1.f9	66	22:36:37	22:42:08
7	2	TRANSIT.1.f10	66	22:42:01	22:47:33
7	3	TRANSIT.1.f11	66	22:47:26	22:52:59
7	4	TRANSIT.1.f12	66	22:50:00	22:55:59
7	5	TRANSIT.1.f13	66	22:55:25	23:00:11
7	6	TRANSIT.2.f1	69	02:49:31	02:54:18
7	7	TRANSIT.2.f2	69	02:54:12	02:58:52
7	8	TRANSIT.2.f3	69	02:58:46	03:03:27

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
8	1	TRANSIT.2.f4	69	03:03:21	03:08:02
8	2	TRANSIT.2.f5	69	03:07:56	03:12:35
8	3	TRANSIT.2.f6	69	03:12:29	03:17:10
8	4	TRANSIT.2.f7	69	03:17:04	03:21:44
8	5	TRANSIT.2.f8	69	03:21:38	03:29:25
8	6	TRANSIT.2.f9	69	03:29:19	03:33:42
8	7	TRANSIT.2.f10	69	03:33:36	03:38:00
8	8	TRANSIT.2.f11	69	03:38:54	03:42:21

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
9	1	CHUK.1.f1	69	03:38:54	03:43:20
9	2	CHUK.1.f2	69	03:43:14	03:47:40
9	3	CHUK.1.f3	69	03:47:34	03:51:59
9	4	CHUK.1.f4	69	03:51:53	03:56:19
9	5	CHUK.1.f5	69	03:56:13	04:03:55
9	6	CHUK.1.f6	69	04:03:28	04:09:11
9	7	CHUK.1.f7	69	04:09:05	04:14:24
9	8	CHUK.1.f8	69	04:14:18	04:19:37
9	9	CHUK.1.f9	69	04:19:31	04:24:50
9	10	CHUK.1.f10	69	04:24:44	04:33:21

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
10	1	CHUK.1.f11	69	04:32:30	04:37:00
10	2	CHUK.1.f12	69	04:36:54	04:41:22
10	3	CHUK.1.f13	69	04:41:16	04:45:45
10	4	CHUK.1.f14	69	04:45:39	04:50:09
10	5	CHUK.1.f15	69	04:50:03	04:57:07
10	6	CHUK.1.f16	69	04:55:59	05:01:16
10	7	CHUK.1.f17	69	05:01:10	05:06:28
10	8	CHUK.1.f18	69	05:06:22	05:11:40
10	9	CHUK.1.f19	69	05:11:34	05:16:51
10	10	CHUK.1.f20	69	05:16:45	05:24:23

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
11	1	CHUK.1.f21	69	05:23:24	05:27:44
11	2	CHUK.1.f22	69	05:27:38	05:31:59
11	3	CHUK.1.f23	69	05:31:53	05:36:12
11	4	CHUK.1.f24	69	05:36:06	05:40:24
11	5	CHUK.1.f25	69	05:40:18	05:44:37
11	6	CHUK.1.f26	69	05:44:31	05:46:18
11	7	CHUK.1.f27	69	05:58:14	06:02:58
11	8	CHUK.1.f28	69	06:02:52	06:07:52

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
12	1	CHUK.1.f29	69	06:06:35	06:11:35
12	2	CHUK.1.f30	69	06:11:29	06:16:30
12	3	CHUK.1.f31	69	06:16:24	06:21:25
12	4	CHUK.1.f32	69	06:21:19	06:26:19
12	5	CHUK.1.f33	69	06:26:13	06:31:14
12	6	CHUK.1.f34	69	06:31:08	06:32:20

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
13	1	CHUK.1.f35	69	06:35:36	06:39:56
13	2	CHUK.1.f36	69	06:39:50	06:44:10
13	3	CHUK.1.f37	69	06:44:04	06:48:24
13	4	CHUK.1.f38	69	06:48:18	06:52:38
13	5	CHUK.1.f39	69	06:52:32	07:00:00

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
14	1	CHUK.1.f40	69	06:58:40	07:03:53
14	2	CHUK.1.f41	69	07:03:47	07:08:59
14	3	CHUK.1.f42	69	07:08:53	07:14:05
14	4	CHUK.1.f43	69	07:13:59	07:19:12
14	5	CHUK.1.f44	69	07:19:06	07:24:19
14	6	CHUK.1.f45	69	07:24:13	07:24:28

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
15	1	CHUK.1.f46	69	07:26:52	07:31:09
15	2	CHUK.1.f47	69	07:31:03	07:35:19
15	3	CHUK.1.f48	69	07:35:13	07:39:32
15	4	CHUK.1.f49	69	07:39:26	07:43:42
15	5	CHUK.1.f50	69	07:43:36	07:47:10
15	6	CHUK.1.f51	69	07:49:50	07:55:00
15	7	CHUK.1.f52	69	07:54:54	08:00:05
15	8	CHUK.1.f53	69	07:59:59	08:05:09
15	9	CHUK.1.f54	69	08:05:03	08:10:15
15	10	CHUK.1.f55	69	08:10:09	08:14:03

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
16	1	CHUK.1.f56	69	08:15:45	08:19:57
16	2	CHUK.1.f57	69	08:19:51	08:24:02
16	3	CHUK.1.f58	69	08:23:56	08:25:18
16	4	CHUK.1.f59	69	08:27:12	08:32:25
16	5	CHUK.1.f60	69	08:32:19	08:37:07

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
17	1	BEAU.TRAN.f1	71	16:04:50	16:09:13
17	2	BEAU.TRAN.f2	71	16:09:07	16:13:38
17	3	BEAU.TRAN.f3	71	16:13:32	16:18:02
17	4	BEAU.TRAN.f4	71	16:17:56	16:22:26
17	5	BEAU.TRAN.f5	71	16:22:20	16:26:50
17	6	BEAU.TRAN.f6	71	16:26:44	16:31:14
17	7	BEAU.TRAN.f7	71	16:31:08	16:35:38
17	8	BEAU.TRAN.f8	71	15:35:30	16:39:55
17	9	BEAU.TRAN.f9	71	16:39:49	16:44:12
17	10	BEAU.TRAN.f10	71	16:44:06	16:48:30

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
18	1	BEAU.TRAN.f11	71	16:48:24	16:52:47
18	2	BEAU.TRAN.f12	71	16:52:41	16:57:07
18	3	BEAU.TRAN.f13	71	16:56:57	17:01:22
18	4	BEAU.TRAN.f14	71	17:01:14	17:05:36
18	5	BEAU.TRAN.f15	71	17:05:30	17:09:52
18	6	BEAU.TRAN.f16	71	17:09:46	17:14:08
18	7	BEAU.TRAN.f17	71	17:14:06	17:18:29
18	8	BEAU.TRAN.f18	71	17:18:26	17:22:42
18	9	BEAU.TRAN.f19	71	17:22:36	17:26:41
18	10	BEAU.TRAN.f20	71	17:26:35	17:30:40

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
19	1	BEAU.TRAN.f21	71	17:30:34	17:34:39
19	2	BEAU.TRAN.f22	71	17:34:33	17:38:38
19	3	BEAU.TRAN.f23	71	17:38:32	17:42:38
19	4	BEAU.TRAN.f24	71	17:42:32	17:46:28
19	5	BEAU.TRAN.f25	71	17:46:22	17:50:18
19	6	BEAU.TRAN.f26	71	17:50:06	17:53:57
19	7	BEAU.TRAN.f27	71	17:53:51	17:57:42
19	8	BEAU.TRAN.f28	71	17:57:36	18:02:05
19	9	BEAU.TRAN.f29	71	18:01:59	18:06:04
19	10	BEAU.TRAN.f30	71	18:05:58	18:10:01

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
20	1	BEAU.TRAN.f31	71	18:09:55	18:14:07
20	2	BEAU.TRAN.f32	71	18:14:01	18:19:17
20	3	BEAU.TRAN.f33	71	18:19:11	18:24:25
20	4	BEAU.TRAN.f34	71	18:24:19	18:29:34
20	5	BEAU.TRAN.f35	71	18:29:28	18:34:43
20	6	BEAU.TRAN.f36	71	18:34:37	18:39:28
20	7	BEAU.TRAN.f37	71	18:39:22	18:43:26
20	8	BEAU.TRAN.f38	71	18:43:20	18:47:24
20	9	BEAU.TRAN.f39	71	18:47:18	18:51:22
20	10	BEAU.TRAN.f40	71	18:51:16	18:55:20

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
21	1	BEAU.TRAN.f41	71	18:55:14	18:59:18
21	2	BEAU.TRAN.f42	71	18:59:12	19:03:16
21	3	BEAU.TRAN.f43	71	19:03:10	19:07:14
21	4	BEAU.TRAN.f44	71	19:07:08	19:11:12
21	5	BEAU.TRAN.f45	71	19:11:06	19:15:10
21	6	BEAU.TRAN.f46	71	19:15:04	19:19:09
21	7	BEAU.TRAN.f47	71	19:19:03	19:23:07
21	8	BEAU.TRAN.f48	71	19:23:01	19:27:04
21	9	BEAU.TRAN.f49	71	19:26:58	19:31:02
21	10	BEAU.TRAN.f50	71	19:30:56	19:34:59

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
22	1	BEAU.TRAN.f51	71	19:34:53	19:38:56
22	2	BEAU.TRAN.f52	71	19:38:50	19:42:53
22	3	BEAU.TRAN.f53	71	19:42:47	19:46:50
22	4	BEAU.TRAN.f54	71	19:46:44	19:50:47
22	5	BEAU.TRAN.f55	71	20:07:06	20:11:48
22	6	BEAU.TRAN.f56	71	20:11:42	20:16:29
22	7	BEAU.TRAN.f57	71	20:16:23	20:21:31
22	8	BEAU.TRAN.f58	71	20:21:25	20:26:33
22	9	BEAU.TRAN.f59	71	20:26:27	20:31:35
22	10	BEAU.TRAN.f60	71	20:31:29	20:36:36

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
23	1	BEAU.TRAN.f61	71	20:36:30	20:41:38
23	2	BEAU.TRAN.f62	71	20:41:32	20:46:40
23	3	BEAU.TRAN.f63	71	20:46:34	20:51:41
23	4	BEAU.TRAN.f64	71	20:51:35	20:56:43
23	5	BEAU.TRAN.f65	71	20:56:37	21:01:47
23	6	BEAU.TRAN.f66	71	21:01:39	21:06:47
23	7	BEAU.TRAN.f67	71	21:06:41	21:11:60
23	8	BEAU.TRAN.f68	71	21:11:54	21:17:03
23	9	BEAU.TRAN.f69	71	21:16:57	21:22:06
23	10	BEAU.TRAN.f70	71	21:27:00	21:27:09

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
24	1	BEAU.TRAN.f71	71	21:27:03	21:32:14
24	2	BEAU.TRAN.f72	71	21:32:08	21:37:17
24	3	BEAU.TRAN.f73	71	21:37:11	21:42:20
24	4	BEAU.TRAN.f74	71	21:42:14	21:47:23
24	5	BEAU.TRAN.f75	71	21:47:17	21:52:26
24	6	BEAU.TRAN.f76	71	21:52:20	21:57:29
24	7	BEAU.TRAN.f77	71	21:57:23	22:02:42
24	8	BEAU.TRAN.f78	71	22:02:36	22:08:26
24	9	BEAU.TRAN.f79	71	22:08:20	22:14:11
24	10	BEAU.TRAN.f80	71	22:14:05	22:19:55

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
25	1	BEAU.TRAN.f81	71	22:19:49	22:25:39
25	2	BEAU.TRAN.f82	71	22:25:33	22:31:03
25	3	BEAU.TRAN.f83	71	22:30:57	22:36:13
25	4	BEAU.TRAN.f84	71	22:36:07	22:41:21
25	5	BEAU.TRAN.f85	71	22:41:15	22:46:29
25	6	BEAU.TRAN.f86	71	22:46:23	22:51:37
25	7	BEAU.TRAN.f87	71	22:51:31	22:56:44
25	8	BEAU.TRAN.f88	71	22:56:38	23:01:51
25	9	BEAU.TRAN.f89	71	23:01:45	23:06:58
25	10	BEAU.TRAN.f90	71	23:06:52	23:12:07

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
26	1	BEAU.TRAN.f91	71	23:12:01	23:17:09
26	2	BEAU.TRAN.f92	71	23:17:03	23:21:53
26	3	BEAU.TRAN.f93	71	23:21:47	23:26:39
26	4	BEAU.TRAN.f94	71	23:26:33	23:31:24
26	5	BEAU.TRAN.f95	71	23:31:18	23:36:10
26	6	BEAU.TRAN.f96	71	23:36:04	23:40:48
26	7	BEAU.TRAN.f97	71	23:40:42	23:45:11
26	8	BEAU.TRAN.f98	71	23:45:05	23:49:32
26	9	BEAU.TRAN.f99	71	23:49:26	23:53:56

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
27	1	BER.TRAN.1.f1	73	16:30:06	16:34:44
27	2	BER.TRAN.1.f2	73	16:34:39	16:39:20
27	3	BER.TRAN.1.f3	73	16:39:15	16:43:55
27	4	BER.TRAN.1.f4	73	16:43:50	16:48:29
27	5	BER.TRAN.1.f5	73	16:48:24	16:53:04
27	6	BER.TRAN.1.f6	73	16:52:59	16:57:38
27	7	BER.TRAN.1.f7	73	16:57:33	17:02:13

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
28	1	BER.TRAN.1.f8	73	16:02:08	17:06:48
28	2	BER.TRAN.1.f9	73	17:06:43	17:11:22
28	3	BER.TRAN.1.f10	73	17:11:17	17:15:55
28	4	BER.TRAN.1.f11	73	17:15:50	17:20:28
28	5	BER.TRAN.1.f12	73	17:20:23	17:25:01
28	6	BER.TRAN.1.f13	73	17:24:56	17:29:34

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
29	1	BER.MOS.f1	73	17:26:00	17:30:37
29	2	BER.MOS.f2	73	17:30:32	17:35:10
29	3	BER.MOS.f3	73	17:35:05	17:39:43
29	4	BER.MOS.f4	73	17:39:38	17:44:15
29	5	BER.MOS.f5	73	17:44:10	17:49:01
29	6	BER.MOS.f6	73	17:48:56	17:54:11
29	7	BER.MOS.f7	73	17:54:04	17:59:19
29	8	BER.MOS.f8	73	17:59:14	18:04:28
29	9	BER.MOS.f9	73	18.04..3	18:12:04

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
30	1	BER.MOS.f10	73	18.10.50	18.15.19
30	2	BER.MOS.f11	73	18:15:14	18:19:43
30	3	BER.MOS.f12	73	18:19:38	18:24:07
30	4	BER.MOS.f13	73	18:24:02	18:28:30
30	5	BER.MOS.f14	73	18:28:25	18:32:54
30	6	BER.MOS.f15	73	18.32.49	18:37:19
30	7	BER.MOS.f16	73	18:37:14	18:41:43
30	8	BER.MOS.f17	73	18:41:38	18:46:07
30	9	BER.MOS.f18	73	18:46:02	18:50:33

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
31	1	BER.MOS.f19	73	18:54:05	18:58:53
31	2	BER.MOS.f20	73	18:58:48	19:03:35
31	3	BER.MOS.f21	73	19:03:30	19:08:17
31	4	BER.MOS.f22	73	19:08:12	19:12:57
31	5	BER.MOS.f23	73	19:12:52	19:17:41
31	6	BER.MOS.f24	73	19:17:36	19:22:45
31	7	BER.MOS.f25	73	19:22:40	19:27:50
31	8	BER.MOS.f26	73	19:27:45	19:32:52
31	9	BER.MOS.f27	73	19:32:47	19:41:00

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
32	1	BER.MOS.f28	73	19:40:01	19:44:30
32	2	BER.MOS.f29	73	19:44:25	19:48:54
32	3	BER.MOS.f30	73	19:48:49	19:53:19
32	4	BER.MOS.f31	73	19:53:14	19:57:43
32	5	BER.MOS.f32	73	19:57:38	20:02:07
32	6	BER.MOS.f33	73	20:02:02	20:06:32
32	7	BER.MOS.f34	73	20:06:27	20:10:56
32	8	BER.MOS.f35	73	20:10:51	20:15:03

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
33	1	BER.MOS.f36	73	20:27:14	20:32:25
33	2	BER.MOS.f37	73	20:32:20	20:37:36
33	3	BER.MOS.f38	73	20:37:25	20:42:35
33	4	BER.MOS.f39	73	20:42:30	20:47:40
33	5	BER.MOS.f40	73	20:47:35	20:52:46
33	6	BER.MOS.f41	73	20:52:41	20:57:50
33	7	BER.MOS.f42	73	20:57:45	21:02:54
33	8	BER.MOS.f43	73	21:02:49	21:06:53

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
34	1	BER.TRAN.2.f1	73	21:14:56	21:16:46
34	2	BER.TRAN.2.f2	73	21:16:41	21:18:05
34	3	BER.TRAN.2.f3	73	21:18:00	21:19:24
34	4	BER.TRAN.2.f4	73	21:19:19	21:20:43
34	5	BER.TRAN.2.f5	73	21:20:38	21:22:02
34	6	BER.TRAN.2.f6	73	21:21:57	21:23:21
34	7	BER.TRAN.2.f7	73	21:23:16	21:24:39
34	8	BER.TRAN.2.f8	73	21:24:34	21:25:58
34	9	BER.TRAN.2.f9	73	21:25:53	21:27:12

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
35	1	BER.TRAN.3.f1	73	21:35:01	21:39:22
35	2	BER.TRAN.3.f2	73	21:39:17	21:43:37
35	3	BER.TRAN.3.f3	73	21:43:32	21:47:50
35	4	BER.TRAN.3.f4	73	21:47:45	21:52:02
35	5	BER.TRAN.3.f5	73	21:51:57	21:56:14
35	6	BER.TRAN.3.f6	73	21:56:09	21:00:25
35	7	BER.TRAN.3.f7	73	22:00:20	22:04:37
35	8	BER.TRAN.3.f8	73	22:04:32	22:08:49
35	9	BER.TRAN.3.f9	73	22:08:44	22:13:30

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
36	1	BER.TRAN.3.f10	73	22:12:55	22:17:12
36	2	BER.TRAN.3.f11	73	22:17:07	22:21:23
36	3	BER.TRAN.3.f12	73	22:21:18	22:25:35
36	4	BER.TRAN.3.f13	73	22:25:30	22:29:47
36	5	BER.TRAN.3.f14	73	22:29:42	22:33:59
36	6	BER.TRAN.3.f15	73	22:33:54	22:38:12
36	7	BER.TRAN.3.f16	73	22:38:07	22:40:35

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
37	1	CHUK.TRAN.1.f1	74	19:15:00	19:18:53
37	2	CHUK.TRAN.1.f2	74	19:18:48	19:22:39
37	3	CHUK.TRAN.1.f3	74	19:22:34	19:26:25
37	4	CHUK.TRAN.1.f4	74	19:26:20	19:30:12
37	5	CHUK.TRAN.1.f5	74	19:30:07	19:33:58
37	6	CHUK.TRAN.1.f6	74	19:33:53	19:37:44

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
38	1	CHUK.TRAN.1.f7	74	19:37:39	19:41:50
38	2	CHUK.TRAN.1.f8	74	19:41:45	19:46:15
38	3	CHUK.TRAN.1.f9	74	19:46:10	19:50:40
38	4	CHUK.TRAN.1.f10	74	19:50:35	19:55:05
38	5	CHUK.TRAN.1.f11	74	19:55:00	19:59:29
38	6	CHUK.TRAN.1.f12	74	19:59:24	20:03:54

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
39	1	CHUK.2.f1	74	20:03:49	20:08:18
39	2	CHUK.2.f2	74	20:08:13	20:12:36
39	3	CHUK.2.f3	74	20:12:31	20:16:54
39	4	CHUK.2.f4	74	20:16:49	20:21:11
39	5	CHUK.2.f5	74	20:21:06	20:25:29
39	6	CHUK.2.f6	74	20:25:24	20:29:46
39	7	CHUK.2.f7	74	20:29:41	20:31:25

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
40	1	CHUK.2.f8	74	20:34:15	20:39:22
40	2	CHUK.2.f9	74	20:39:17	20:44:23
40	3	CHUK.2.f10	74	20:44:18	20:49:25
40	4	CHUK.2.f11	74	20:49:20	20:54:27
40	5	CHUK.2.f12	74	20:54:22	20:59:28
40	6	CHUK.2.f13	74	20:59:23	20:04:30
40	7	CHUK.2.f14	74	21:04:25	20:05:10

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
41	1	CHUK.2.f15	74	21:08:03	21:12:26
41	2	CHUK.2.f16	74	21:12:21	21:16:45
41	3	CHUK.2.f17	74	21:16:40	21:21:03
41	4	CHUK.2.f18	74	21:20:58	21:25:21
41	5	CHUK.2.f19	74	21:25:16	21:29:40
41	6	CHUK.2.f20	74	21:29:35	21:33:58
41	7	CHUK.2.f21	74	21:33:53	21:36:04

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
42	1	CHUK.2.f22	74	21:39:21	21:44:24
42	2	CHUK.2.f23	74	21:44:19	21:49:22
42	3	CHUK.2.f24	74	21:49:17	21:54:20
42	4	CHUK.2.f25	74	21:54:15	21:59:18
42	5	CHUK.2.f26	74	21:59:13	22:04:16
42	6	CHUK.2.f27	74	22:04:11	22:09:14
42	7	CHUK.2.f28	74	22:09:09	22:11:17

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
43	1	CHUK.2.f29	74	22:14:02	22:18:22
43	2	CHUK.2.f30	74	22:18:17	22:22:37
43	3	CHUK.2.f31	74	22:22:32	22:26:52
43	4	CHUK.2.f32	74	22:26:47	22:31:07
43	5	CHUK.2.f33	74	22:31:02	22:35:22
43	6	CHUC.2.f34	74	22:35:17	22:39:36
43	7	CHUC.2.f35	74	22:39:31	22:42:05

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
44	1	CHUK.2.f36	74	22:45:04	22:50:08
44	2	CHUK.2.f37	74	22:50:03	22:55:06
44	3	CHUK.2.f38	74	22:55:01	23:00:04
44	4	CHUK.2.f39	74	22:59:59	23:05:01
44	5	CHUK.2.f40	74	23:04:56	23:09:59
44	6	CHUK.2.f41	74	23:09:54	23:14:57
44	7	CHUK.2.f42	74	23:14:52	23:17:23

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
45	1	CHUK.LA.f1	74	23:37:04	23:38:32
45	2	CHUK.LA.f2	74	23:38:27	23:39:53
45	3	CHUK.LA.f3	74	23:39:48	23:41:13
45	4	CHUK.LA.f4	74	23:41:07	23:42:32
45	5	CHUK.LA.f5	74	23:42:27	23:43:52
45	6	CHUK.LA.f6	74	23:43:47	23:45:13
45	7	CHUK.LA.f7	74	23:45:08	23:46:34
45	8	CHUK.LA.f8	74	23:46:29	23:47:55
45	9	CHUK.LA.f9	74	23:47:50	23:49:15
45	10	CHUK.LA.f10	74	23:49:10	23:50:35

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
46	1	CHUK.LA.f11	74	23:50:30	23:51:56
46	2	CHUK.LA.f12	74	23:51:51	23:53:17
46	3	CHUK.LA.f13	74	23:53:12	23:54:38
46	4	CHUK.LA.f14	74	23:54:33	23:55:30
46	5	CHUK.LA.f15	74	25:57:26	23:59:51
46	6	CHUK.LA.f16	74/75	23:58:46	00:00:10
46	7	CHUK.LA.f17	74	00:00:05	00:01:29
46	8	CHUK.LA.f18	74	00:01:24	00:02:48
46	9	CHUK.LA.f19	74	00:02:43	00:03:33

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
47	1	CHUK.TRAN.2.f1	75	00:12:09	00:17:00
47	2	CHUK.TRAN.2.f2	75	00:16:55	00:21:45
47	3	CHUK.TRAN.2.f3	75	00:21:40	00:26:29
47	4	CHUK.TRAN.2.f4	75	00:26:24	00:31:14
47	5	CHUK.TRAN.2.f5	75	00:31:09	00:35:59
47	6	CHUK.TRAN.2.f6	75	00:35:54	00:41:15
47	7	CHUK.TRAN.2.f7	75	00:41:10	00:46:37
47	8	CHUK.TRAN.2.f8	75	00:46:32	00:51:57
47	9	CHUK.TRAN.2.f9	75	00:51:52	00:57:17

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT START	GMT STOP
48	1	CHUK.TRAN.2.f10	75	00:57:12	01:02:37
48	2	CHUK.TRAN.2.f11	75	01:02:32	01:07:56
48	3	CHUK.TRAN.2.f12	75	01:07:51	01:13:17
48	4	CHUK.TRAN.2.f13	75	01:13:12	01:18:36
48	5	CHUK.TRAN.2.f14	75	01:18:31	01:23:56
48	6	CHUK.TRAN.2.f15	75	01:23:51	01:29:18
48	7	CHUK.TRAN.2.f16	75	01:29:13	01:34:38
48	8	CHUK.TRAN.2.f17	75	01:34:33	01:39:57

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